black

silver

HA-300

HITACHI

HITACHI HI-FI COMPONENT

INTEGRATED AMPLIFIER

MODEL HA-300

SERVICE MANUAL

No. 75 1974

1. SPECIFICATIONS

Circuitry	Pure complementary inverted Darlington OCL circuit
Semi-conductor	IC : 2, Transistor : 14, Diode : 12
Output	
RMS power	15 watts per channel, min. RMS at 8 ohms from 30Hz to 20kHz, with no more than 0.8% total harmonic distortion
	23 W/ch + 23 W/ch (4 ohms, T.H.D. 0.8%)
Music power (IHF)	26 W/ch + 26 W/ch (8 ohms, T.H.D. 1%)
Frequency characteristic	20 — 30,000Hz (± 2 dB)
Power bandwidth	30 — 20,000Hz (15W, 8 ohms Load, 2 channel driven)
Distortion	0.8% (at RMS power output) 0.05% (at 10W output, 1kHz, 8 ohms Load)
Damping factor	55 (1 kHz, 8 ohms Load)
Input sensitivity	MIC : 4.8mV (8k ohms) PHONO : 2.4mV (45k ohms) TUNER/AUX : 140mV (50k ohms) TAPE-1/TAPE-2 : 140mV (50k ohms) DIN : 400mV (160k ohms)
Recording output level	TAPE REC OUT (Pin Jack): 150mV TAPE REC OUT (DIN) : 40mV
Tone control	BASS : ± 10 dB (100 Hz) TREBLE : ± 10 dB (10 kHz)
Loudness control	+ 10 dB (100Hz) + 5 dB (10kHz)
Equalizer	RIAA ± 2 dB
Signal to noise ratio (IHF A network)	PHONO : 74 dB AUX/TUNER : 94 dB
Residual noise	0.4mV
Power supply & Power consumption	AC 120V 60Hz 75W AC 220V – 240V 50Hz 120W
Dimensions	15⅝(W) x 4¾(H)x12½(D)in. (39.0 x 12.1 x 31.8 cm)
Weight	14.8 lbs. (6.7kg)
Accessory circuits	Loudness switch, Tape monitor switch—1, 2, DIN record/playback connector, Headphone jack, Microphone jack

* The above specifications are subject to change for improvement without notice.

2. FEATURES

1. The HA-300 gives rich and clear sound because of the pure complementary OCL output circuit.
2. Low distortion design with IC-drive inverted Darlington circuit.
3. An amplifier exclusively for the microphone is incorporated and mixing with other program sources is possible.
4. With two tape decks connected, tape dubbing is possible.
5. Two sets of speakers can be connected and selected by switching.

3. FRONT AND REAR PANEL

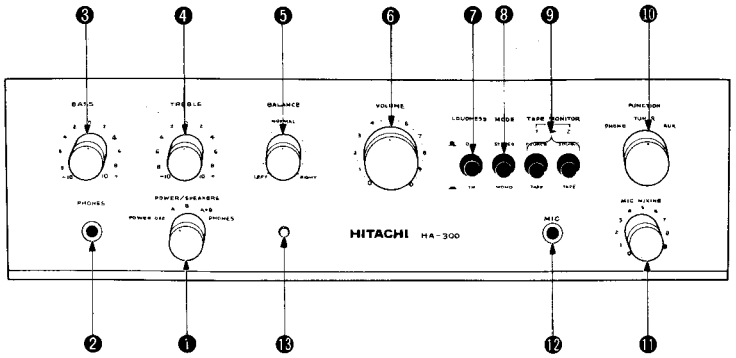


Fig. 1

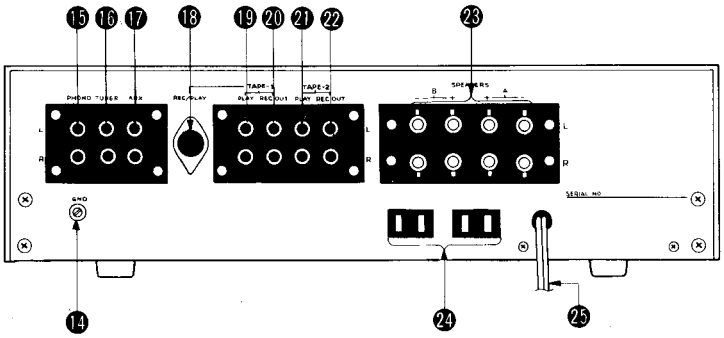


Fig. 2

❶ POWER/SPEAKER SWITCH
❷ PHONES JACK
❸ BASS CONTROL
❹ TREBLE CONTROL
❺ BALANCE CONTROL
❻ VOLUME CONTROL
❼ LOUDNESS SWITCH
❽ MODE SWITCH
❾ TAPE MONITOR SWITCH
❿ FUNCTION SWITCH
⓫ MIC MIXING VOLUME CONTROL
⓬ MICROPHONE JACK
⓭ PILOT LAMP

⓮ GROUND TERMINAL
⓯ PHONO INPUT TERMINALS
⓰ TUNER INPUT TERMINALS
⓱ AUX INPUT TERMINALS
⓲ DIN RECORD/PLAYBACK SOCKET
⓳ TAPE-1 PLAYBACK TERMINALS
⓴ TAPE-1 RECORDING OUT TERMINALS
㉑ TAPE-2 PLAYBACK TERMINALS
㉒ TAPE-2 RECORDING OUT TERMINALS
㉓ SPEAKER TERMINALS
㉔ AC POWER OUTLETS (120V set only)
㉕ AC POWER CORD

4. BLOCK DIAGRAM

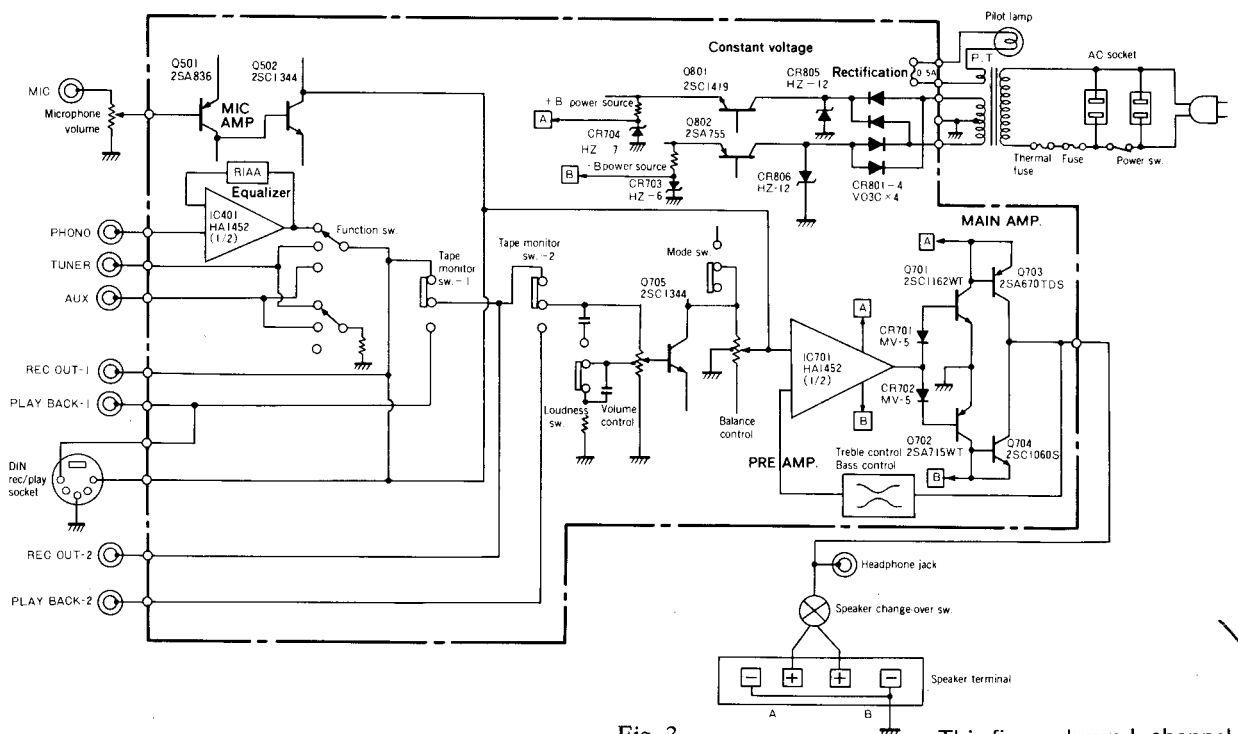
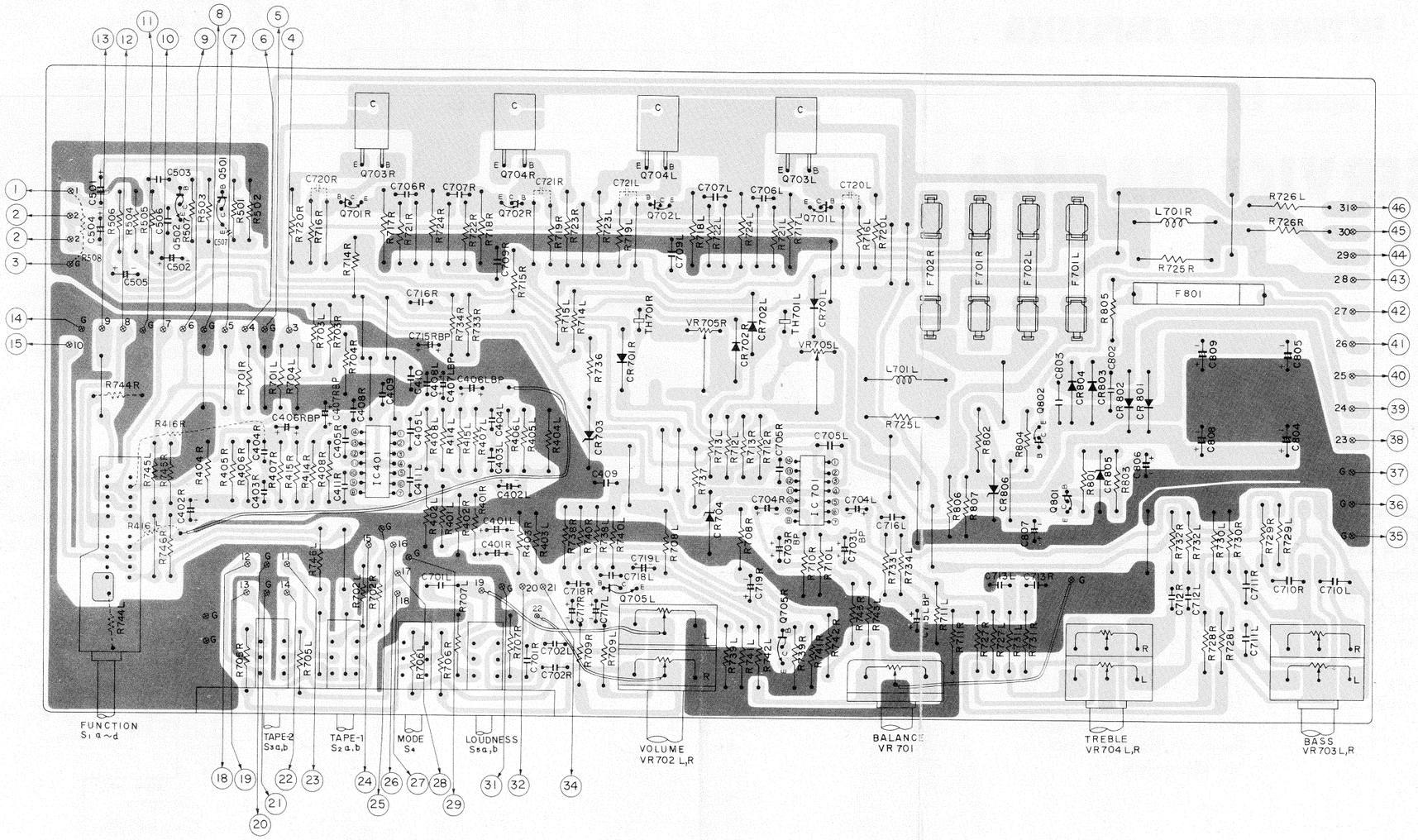


Fig. 3

This figure shows L channel only.

5. PRINTED WIRING BOARD



① MICROPHONE VOLUME
② MICROPHONE JACK
③ EARTH
④ DIN REC/PLAY TERMINAL ①
⑤ EARTH
⑥ DIN REC/PLAY TERMINAL ④
⑦ TAPE-1 REC OUT TERMINAL (R)
⑧ EARTH
⑨ TAPE-1 REC OUT TERMINAL (L)
⑩ TUNER INPUT TERMINAL (R)
⑪ EARTH
⑫ TUNER INPUT TERMINAL (L)
⑬ AUX INPUT TERMINAL (R)
⑭ EARTH
⑮ AUX INPUT TERMINAL (L)

⑱ TAPE-2 REC OUT TERMINAL (L)
⑲ TAPE-2 PLAYBACK TERMINAL (R)
⑳ EARTH
㉑ EARTH
㉒ TAPE-2 PLAYBACK TERMINAL (L)
㉓ TAPE-2 REC OUT TERMINAL (R)
㉔ DIN REC/PLAY TERMINAL ③
㉕ EARTH
㉖ DIN REC/PLAY TERMINAL ⑤
㉗ TAPE-1 PLAYBACK TERMINAL (R)
㉘ TAPE-1 PLAYBACK TERMINAL (L)
㉙ EARTH

㉛ EARTH
㉜ PHONO INPUT TERMINAL (R)

㉞ PHONO INPUT TERMINAL (L)
㉟ EARTH
㊱ EARTH

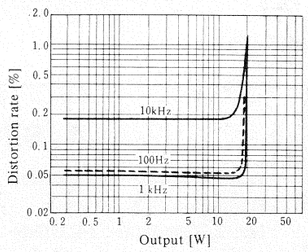
㊲ EARTH
㊳ POWER TRANSFORMER
㊴ POWER TRANSFORMER
㊵ POWER TRANSFORMER
PILOT LAMP
㊶ PILOT LAMP
㊷ POWER TRANSFORMER
㊸ ROTARY SWITCH (S6b)
㊹ ROTARY SWITCH (S6a)
㊺ HEADPHONE JACK
㊻ HEADPHONE JACK

6. CHARACTERISTICS

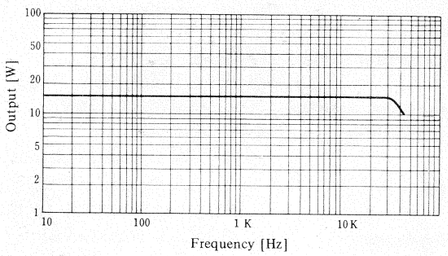
Measuring equipment

Audio Osc.	MODEL 4000
VTVM	MODEL 4302 B
Distortion Meter	MODEL MAK-659A

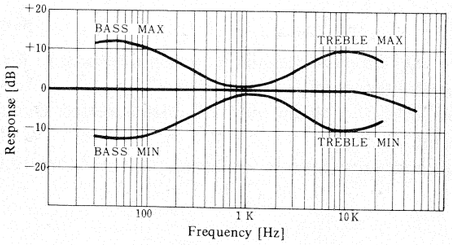
POWER VS DISTORTION RATE CHARACTERISTICS
INPUT: : TUNER
OUTPUT : 8 ohms LOAD, 2 channel driven



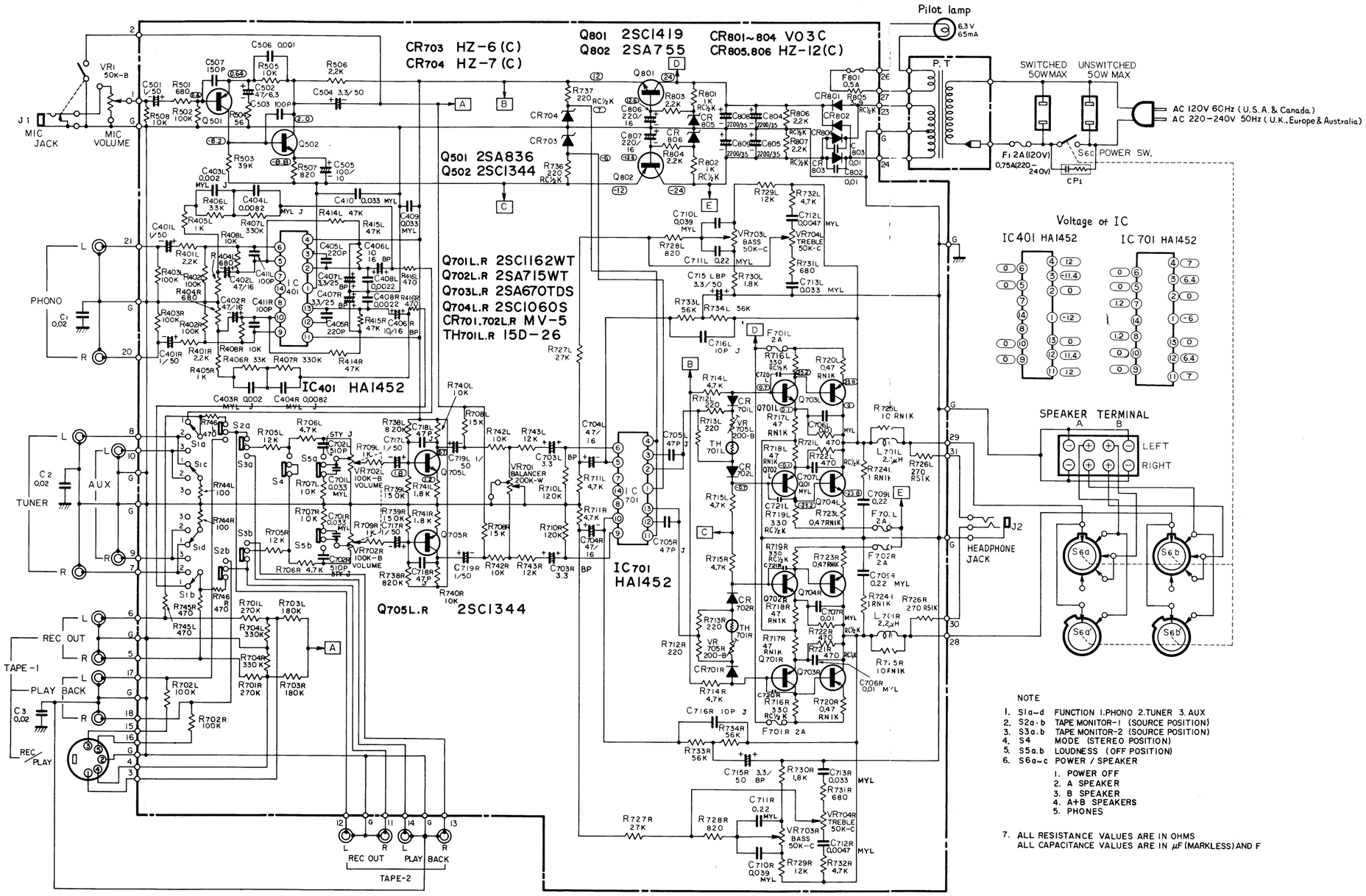
POWER BAND WIDTH
INPUT : TUNER
OUTPUT : 8 ohms LOAD, 2 channel driven
DISTORTION RATE : 1% constant



FREQUENCY CHARACTERISTICS
TONE CONTROL CHARACTERISTICS
INPUT : TUNER
OUTPUT : 8 ohms LOAD



7. CIRCUIT DIAGRAM



NOTE

1. S1a~d FUNCTION 1.PHONO 2.TUNER 3.AUX
2. S2a·b TAPE MONITOR-1 (SOURCE POSITION)
3. S3a.b TAPE MONITOR-2 (SOURCE POSITION)
4. S4 MODE (STEREO POSITION)
5. S5a.b LOUDNESS (OFF POSITION)
6. S6a~c POWER / SPEAKER
   1. POWER OFF
   2. A SPEAKER
   3. B SPEAKER
   4. A+B SPEAKERS
   5. PHONES
7. ALL RESISTANCE VALUES ARE IN OHMS
   ALL CAPACITANCE VALUES ARE IN μF (MARKLESS) AND F

The circuit diagram is subject to change for improvement without notice.

8. SERVICE POINT

Removing the audio printed wiring board

1. Detach escutcheon after removing cover and bottom board. (Remove escutcheon fixing screws after pulling off knobs and detaching nuts).
2. Remove screws and nuts shown in Fig. 4.
3. Remove screws shown in Fig. 5, pull out the control plate slightly forward, slip the audio printed wiring board slightly backward, and the audio printed wiring board comes off together with the radiator.

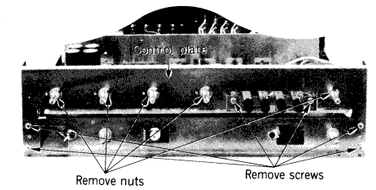


Fig. 4

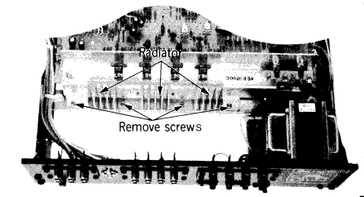


Fig. 5

9. THE NEW CIRCUIT

Emitter grounded inverted Darlington circuit

This is an output circuit system. The circuit used in the main amplifier output of this unit is shown in Fig. 3. The input signal is amplified in driver stages, Q_1 and Q_2, and further amplified in the output stages, Q_3 and Q_4. The feature of this circuit is that, when compared with the conventional circuit which uses the emitter follower system for both the driver stage and output stage, its voltage gain is greater and efficiency is good since both the driver stage and output stage are operated by emitter grounding; in the conventional circuit, the output voltage is limited by the swing voltage of the driver stage, but in this circuit, since the output stage is operated by emitter grounding, the output voltage is limited by the power voltage. Further, since the voltage gain is obtained in the driver stage and output stage, improvement of the distortion ratio is possible by applying a big negative feed-back. And, since the power voltage of the first stage of the main amplifier may be kept at a low level, a low noise transistor and IC can be used and a high signal to noise ratio can be obtained.

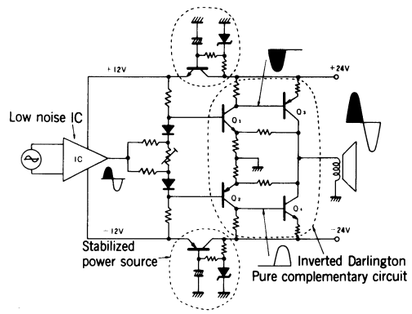


Fig. 6

10. REPLACEMENT PARTS LIST

SYMBOL NO.	STOCK NO.	DESCRIPTION		
CAPACITORS				
C401(L,R)	0252811	Electrolytic	1μF	50V
C402(L,R)	0252525	Electrolytic	47μF	16V
C403(L,R)	0274242	Mylar, film	2000pF±5%	50V
C404(L,R)	0274236	Mylar, film	8200pF±5%	50V
C405(L,R)	0248732	Ceramic, discal	220pF±10%	50V
C406(L,R)	0257145	Electrolytic	10μF	16V
C407(L,R)	0257163	Electrolytic	3.3μF	25V
C408(L,R)	0274013	Mylar, film	2200pF±10%	50V
C409	0275014	Mylar, film	0.033μF±10%	50V
C410	0275014	Mylar, film	0.033μF±10%	50V
C411(L,R)	0248724	Ceramic, discal	100pF±10%	50V
C501	0252811	Electrolytic	1μF	50V
C502	0252225	Electrolytic	47μF	6.3V
C503	0248724	Ceramic, discal	100pF±10%	50V
C504	0252813	Electrolytic	3.3μF	50V
C505	0252331	Electrolytic	100μF	10V
C506	0274011	Mylar, film	1000pF±10%	50V
C507	0248728	Ceramic, discal	150pF±10%	50V
C701(L,R)	0275014	Mylar, film	0.033μF±10%	50V
C702(L,R)	0228328	Styrol	510pF±5%	50V
C703(L,R)	0257183	Electrolytic	3.3μF	50V
C704(L,R)	0252525	Electrolytic	47μF	16V
C705(L,R)	0248676	Ceramic, discal	47pF±5%	50V
C706(L,R)	0275011	Mylar, film	0.01μF±10%	50V
C707(L.R)	0275011	Mylar, film	0.01μF±10%	50V
C709(L,R)	0276013	Mylar, film	0.22μF±10%	50V
C710(L,R)	0275034	Mylar, film	0.039μF±10%	50V
C711(L,R)	0276013	Mylar, film	0.22μF±10%	50V
C712(L,R)	0274015	Mylar, film	4700pF±10%	50V
C713(L,R)	0275014	Mylar, film	0.033μF±10%	50V
C715(L,R)	0257183	Electrolytic	3.3μF	50V
C716(L,R)	0248650	Ceramic, discal	10pF±5%	50V
C717(L,R)	0252811	Electrolytic	1μF	50V
C718(L,R)	0248676	Ceramic, discal	47pF±5%	50V
C719(L,R)	0252811	Electrolytic	1μF	50V
C720(L,R)	0248650	Ceramic, discal	10pF±5%	50V
C721(L,R)	0248650	Ceramic, discal	10pF±5%	50V
C802	0245408	Ceramic, discal	0.01μF±20%	500V
C803	0245408	Ceramic, discal	0.01μF±20%	500V
C804	0252742	Electrolytic	2200μF	35V
C805	0252742	Electrolytic	2200μF	35V
C806	0252532	Electrolytic	220μF	16V
C807	0252532	Electrolytic	220μF	16V
C808	0252742	Electrolytic	2200μF	35V
C809	0252742	Electrolytic	2200μF	35V
for CHASSIS ASSEMBLY				
C1	0245018	Ceramic, discal	0.02μF $^{+80}_{-20}$ %	25V
C2	0245018	Ceramic, discal	0.02μF $^{+80}_{-20}$ %	25V
C3	0245018	Ceramic, discal	0.02μF $^{+80}_{-20}$ %	25V
RESISTORS				
R401(L,R)	0114169	Carbon film	2.2kΩ±5%	SRD¼D
R402(L,R)	0114281	Carbon film	100kΩ±5%	SRD¼D
R403(L,R)	0114281	Carbon film	100kΩ±5%	SRD¼D
R404(L,R)	0114151	Carbon film	680Ω±5%	SRD¼D
R405(L,R)	0114161	Carbon film	1kΩ±5%	SRD¼D
R406(L,R)	0114213	Carbon film	33kΩ±5%	SRD¼D
R407(L,R)	0114293	Carbon film	330kΩ±5%	SRD¼D
R408(L,R)	0114201	Carbon film	10kΩ±5%	SRD¼D
R414(L,R)	0114217	Carbon film	47kΩ±5%	SRD¼D
R415(L,R)	0114217	Carbon film	47kΩ±5%	SRD¼D
R416(L,R)	0114147	Carbon film	470Ω±5%	SRD¼D
R501	0114151	Carbon film	680Ω±5%	SRD¼D
R502	0114281	Carbon film	100kΩ±5%	SRD¼D
R503	0114215	Carbon film	39kΩ±5%	SRD¼D
R504	0114059	Carbon film	56Ω±5%	SRD¼D
R505	0114201	Carbon film	10kΩ±5%	SRD¼D
R506	0114169	Carbon film	2.2kΩ±5%	SRD¼D
R507	0114153	Carbon film	820Ω±5%	SRD¼D
R508	0114201	Carbon film	10kΩ±5%	SRD¼D
R701(L,R)	0114291	Carbon film	270kΩ±5%	SRD¼D
R702(L,R)	0114281	Carbon film	100kΩ±5%	SRD¼D
R703(L,R)	0114287	Carbon film	180kΩ±5%	SRD¼D
R704(L,R)	0114293	Carbon film	330kΩ±5%	SRD¼D
R705(L,R)	0114203	Carbon film	12kΩ±5%	SRD¼D
R706(L,R)	0114177	Carbon film	4.7kΩ±5%	SRD¼D
R707(L,R)	0114201	Carbon film	10kΩ±5%	SRD¼D
R708(L,R)	0114205	Carbon film	15kΩ±5%	SRD¼D
R709(L,R)	0114161	Carbon film	1kΩ±5%	SRD¼D
R710(L,R)	0114283	Carbon film	120kΩ±5%	SRD¼D
R711(L,R)	0114177	Carbon film	4.7kΩ±5%	SRD¼D
R712(L,R)	0114139	Carbon film	220Ω±5%	SRD¼D
R713(L,R)	0114139	Carbon film	220Ω±5%	SRD¼D
R714(L,R)	0114177	Carbon film	4.7kΩ±5%	SRD¼D
R715(L,R)	0114177	Carbon film	4.7kΩ±5%	SRD¼D
R716(L,R)	0134367	Composition	330Ω±10%	RC½GF
R717(L,R)	0119049	Metal	47Ω±10%	RN1B
R718(L,R)	0119049	Metal	47Ω±10%	RN1B
R719(L,R)	0134367	Composition	330Ω±10%	RC½GF
R720(L,R)	0119017	Metal	0.47Ω±10%	RN1B
R721(L,R)	0134369	Composition	470Ω±10%	RC½GF
R722(L,R)	0134369	Composition	470Ω±10%	RC½GF
R723(L,R)	0119017	Metal	0.47Ω±10%	RN1B
R724(L,R)	0119021	Metal	1Ω±10%	RN1B
R725(L,R)	0119041	Metal	10Ω±10%	RN1B
R726(L,R)	0119426	Metal, oxide	270Ω±10%	RD1PA
R727(L,R)	0114211	Carbon film	27kΩ±5%	SRD¼D
R728(L,R)	0114153	Carbon film	820Ω±5%	SRD¼D
R729(L,R)	0114203	Carbon film	12kΩ±5%	SRD¼D
R730(L,R)	0114167	Carbon film	1.8kΩ±5%	SRD¼D
R731(L,R)	0114151	Carbon film	680Ω±5%	SRD¼D
R732(L,R)	0114177	Carbon film	4.7kΩ±5%	SRD¼D
R733(L,R)	0114219	Carbon film	56kΩ±5%	SRD¼D
R734(L,R)	0114219	Carbon film	56kΩ±5%	SRD¼D
R736	0134365	Composition	220Ω±10%	RC½GF
R737	0134365	Composition	220Ω±10%	RC½GF
R738(L,R)	0114303	Carbon film	820kΩ±5%	SRD¼D
R739(L,R)	0114285	Carbon film	150kΩ±5%	SRD¼D
R740(L,R)	0114201	Carbon film	10kΩ±5%	SRD¼D
R741(L,R)	0114167	Carbon film	1.8kΩ±5%	SRD¼D
R742(L,R)	0114201	Carbon film	10kΩ±5%	SRD¼D
R743(L,R)	0114203	Carbon film	12kΩ±5%	SRD¼D
R744(L,R)	0114131	Carbon film	100Ω±5%	SRD¼D
R745(L,R)	0114147	Carbon film	470Ω±5%	SRD¼D
R746(L,R)	0114147	Carbon film	470Ω±5%	SRD¼D
R801	0134373	Composition	1kΩ±10%	RC½GF
R802	0134373	Composition	1kΩ±10%	RC½GF

SYMBOL NO.	STOCK NO.	DESCRIPTION		
R803	0114169	Carbon film	2.2kΩ±5%	SRD¼D
R804	0114169	Carbon film	2.2kΩ±5%	SRD¼D
R805	0134284	Composition	3.9Ω±10%	RC½GF
R806	0134377	Composition	2.2kΩ±10%	RC½GF
R807	0134377	Composition	2.2kΩ±10%	RC½GF

TRANSISTORS

IC401	2367151	HA1452
IC701	2367151	HA1452
Q501	2327742	2SA836(D)
Q502	2327443	2SC1344(E)
Q701(L,R)	2327712	2SC1162WT(B)
Q702(L,R)	2327702	2SA715WT(B)
Q703(L,R)	2327359	2SA670TDS(C)
Q704(L,R)	2327206	2SC1060S(C)
Q705(L,R)	2327443	2SC1344(E)
Q801	2327592	2SC1419(B)
Q802	2327722	2SA755(B)

DIODES

CR701(L,R)	2347041	MV-5
CR702(L,R)	2347041	MV-5
CR703	2337123	HZ-6(C)
CR704	2327733	HZ-7(C)
CR801	2327031	V03C
CR802	2327031	V03C
CR803	2327031	V03C
CR804	2327031	V03C
CR805	2337103	HZ-12(C)
CR806	2337103	HZ-12(C)

VARIABLE RESISTORS

VR701	0153235	200kΩ-(W)	BALANCE
VR702(L,R)	0153810	100kΩ-(B) x 2	VOLUME
VR703(L,R)	0156603	50kΩ-(C) x 2	BASS
VR704(L,R)	0156603	50kΩ-(C) x 2	TREBLE
VR705(L,R)	0151223	200Ω-(B) x 2	Idle current adj.
VR1	0153709	50kΩ-(B)	MIC VOLUME

COIL

L701(L,R)	2227141	Audio trap coil (2.2μH)

MISCELLANEOUS

	2505092	Audio printed wiring board assembly
S1(a~d)	2617522	Switch-rotary switch (for function sw.) (for U.K., Europe & Australia)
S1(a~d)	2617521	Switch-rotary switch (for function sw.) (for U.S.A. & Canada)
S2~5	2637602	Switch-push switch (for loudness, mode, tape monitor sw.-1, 2)
S6(a~c)	2617471	Switch-rotary switch (for power/speaker sw.)
J1	2677064	Jack-microphone jack
J2	2677232	Jack-headphone jack
F1	2720052	Fuse-wired in fuse (0.75A) (for U.K., Europe & Australia)

SYMBOL NO.	STOCK NO.	DESCRIPTION
F1	2727089	Fuse-wired in fuse (2A) (for U.S.A. & Canada)
F701, 702 (L,R)	2720031	Fuse-fuse (2A)
F801	2727201	Fuse-wired in fuse (0.5A)
TH701(L,R)	0576042	Thermister
CP 1	0269014	Spark killer
	4681371	Rubber bush
	2767118	Lamp-pilot lamp (6.3V, 65mA)
	4567411	3 x 6φ CT bind screw (yellow)
	4567451	3 x 6φ CT bind screw (silver)
	4567412	3 x 8φ CT bind screw
	4567433	3 x 10φ CT bind screw
	8811234	Washer-3φ washer
	2687392	4P terminal board
	2687451	6P terminal board
	2217883	Power transformer (for U.K., Europe & Australia)
	2217882	Power transformer (for U.S.A. & Canada)
	3715184	Bushing (for Australia)
	0043793	Bushing (for U.S.A. & Canada)
	3913001	Bushing (for Europe)
	3913005	Bushing (for U.K.)
	0544510	Lug terminal
	4090091	Screw-earth screw
	4387283	AC bush plate (for U.K. & Europe)
	4387285	AC bush plate (for Australia)
	3920381	Cover-AC outlet cover (for U.K., Europe & Australia)
	2687661	Terminal-8P screw terminal
	2687642	8P US pin jack
	2687632	6P US pin jack
	0541358	Socket-DIN 5P socket
	2748441	AC power cord (for U.S.A. & Canada)
	2747481	AC power cord (for Europe)
	2747732	AC power cord (for U.K.)
	2747301	AC power cord (for Australia)
	2787221	Belt (for AC power cord) (for Europe)

for FINAL ASSEMBLY

	3243211	Escutcheon assembly (for U.S.A. & Canada)
	3243212	Escutcheon assembly (for U.K., Europe & Australia)
	3282255	Knob-Power/speaker knob
	3282251	Knob-Volume knob
	3282252	Knob-Bass, Treble, Function knob } (for U.S.A. & Canada)
	3282253	Knob-Balance, Mic volume knob } (for U.S.A. & Canada)
	3282875	Knob-Power/speaker knob
	3282871	Knob-Volume knob
	3282872	Knob-Function knob } (for U.K., Europe & Australia)
	3282873	Knob-Bass, Treble, Balance, Mic volume knob } (for U.K., Europe & Australia)
	4386003	Cover assembly
	4385451	Bottom board assembly
	3916411	Leg
	4368861	Washer-13.2φ washer
	3914611	Washer-13.5φ washer
	4567411	3 x 6φ CT bind screw
	4567414	3 x 12φ CT bind screw
	4567441	4 x 6φ CT bind screw

for DIAL MECHANISM ASSEMBLY

4567433	3 x 10φ CT bind screw
4567411	3 x 6φ CT bind screw
4567422	4 x 8φ CT bind screw
0544510	Lug terminal

HITACHI

Head Office : 5-1, 1-chome, Marunouchi, Chiyoda-ku, Tokyo
Tel. : Tokyo (212) 1111 (80 lines)
Cable Address : "HITACHY" TOKYO
Codes : All Codes Used

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